

Applicant : Norman Shendon et al.
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Attorney's Docket No.: 00770C6-099006

REMARKS

In reply to the Office Action of June 3, 2004, the applicant submits the following remarks and respectfully requests reconsideration.

Claims 1-20 were pending. Claims 1 and 15 have been amended. Claim 2 has been cancelled. Claims 1 and 3-20 are now pending.

Claims 1-2, 4-9, 14-15, and 17-20 were rejected under 35 U.S.C. 102(b) as being anticipated by Breivogel et al. (U.S. Patent No. 5,635,083).

The Examiner noted that the "housing" in Claim 1 was broadly claimed such that it could be read onto a housing supporting the polishing pad. The applicant has amended Claim 1 to more clearly indicate that the "housing" is a "polishing head housing," rather than a housing supporting the polishing pad. The applicant has also moved the language of dependent Claim 2 into independent Claim 1. Claim 1 now calls for a backing member that is moveable relative to the polishing head housing. In contrast, Breivogel teaches a circular stainless steel base 302 attached directly to a steel rotatable drive shaft 304 (FIG. 3A). Breivogel does not teach a polishing head housing, nor does it teach a backing member being moveable relative to the polishing head housing where the backing member includes an opening for fluid to flow into contact with the substrate.

The applicant has also amended Claim 15 to more clearly indicate that the method of polishing includes holding a substrate against a moveable backing member in a carrier head including a polishing head housing, and positioning the substrate against a polishing surface by moving the backing member toward the polishing surface. Breivogel teaches pressing a substrate 310 against a polishing pad using pneumatic pressure applied directly to a portion of the backside of the substrate. Breivogel does not teach positioning a substrate against a polishing surface by moving the backing member towards the polishing surface and directing a fluid through an opening in the backing member to press the substrate against a polishing pad.

Claims 3 and 9-13 were rejected under 35 U.S.C. 103(a) as being unpatentable over Breivogel in view of Shendon et al. (U.S. Patent No. 5,205,082). Breivogel teaches a lip seal 318 that creates a leak-tight seal against the backside of a wafer 310, the side of a carrier base

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302, and the inside of a wear ring 314 (FIG. 3A). Pneumatic pressure is used to forcibly press the wafer 310 against the polishing pad 316 during polishing.

Shendon '082 teaches a diaphragm 29 connected to a carrier 28 and a retainer 27 (FIG. 2). The carrier 28 is moved downward by a pressure inside the chamber defined by the diaphragm 29.

Since Breivogel already teaches a method for applying a downward force on the wafer using a lip seal, there would be no motivation to combine Breivogel with Shendon. The presence of a lip seal like the one in Breivogel would seem to make the use of a membrane to provide downward pressure redundant and unnecessary. In fact, Breivogel discloses an alternative wafer carrier using a flexible membrane very similar to the membrane in Shendon. The alternative wafer carrier 400 uses pneumatic pressure inside a chamber 406 which is transferred to a solid backing plate 410 containing a wafer 404 through a flexible diaphragm 408 (FIG. 4).

Significantly, the alternative wafer carrier in Breivogel does not use a lip seal, even though the inventor clearly knew of the lip seal. The two wafer carriers in Breivogel employ different modes of operation. In one mode, pneumatic pressure is applied directly to the back side of a wafer. In another mode, pneumatic pressure is applied to a solid backing plate. Breivogel does not suggest combining these different modes of operation, nor would it be obvious that combining these two modes would provide any significant advantages over simply using one or the other. This demonstrates that the desirability of utilizing a polishing head with both a backing member moveable relative to a polishing head housing and an opening for fluid to flow into contact with a substrate to press the substrate against a polishing pad would not have been obvious to a person having ordinary skill in the art.

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Applicant asks that all claims be allowed. Please apply any other charges or credits to deposit account 06-1050.

Respectfully submitted,

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